

**OCCURRENCE OF THE EUCALYPTUS PSYLLID *CTENARYTAINA EUCALYPTI* (MASKELL) (HOM.: PSYLLOIDEA) AND ITS PARASITOID *PSYLLAEPHAGUS PILOSUS* NOYES (HYM.: ENCYRTIDAE) IN THE ISLE OF MAN**

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**Abstract**

The eucalyptus psyllid *Ctenarytaina eucalypti* (Maskell) (Hom.: Psylloidea) and its parasitoid *Psyllaephagus pilosus* Noyes (Hym.: Encyrtidae) are reported from the Isle of Man. The source and mode of entry of *P. pilosus* and its distribution in the Isle of Man are discussed.

**Introduction**

The eucalyptus psyllid *Ctenarytaina eucalypti* (Maskell) (Hom.: Psylloidea: Spondylaspididae), also known as the eucalyptus sucker, was first noted in the Isle of Man by J. H. Martin on 15.vii.1996 feeding on *Eucalyptus* sp. at Royal Avenue, Onchan (SC3977) (JHM pers. comm. 27.i.2004). I was unaware of this record when on 6.viii.2002 I collected specimens on *Eucalyptus* sp. in the Curraghs Wild Life Park, Ballaugh (SC3794). Adults of an encyrtid were also collected and these, as well as adults reared from mummified nymphs of *C. eucalypti*, were identified by J. S. Noyes as *Psyllaephagus pilosus* Noyes (Hym.: Encyrtidae) a parasitoid introduced into the United Kingdom and Ireland for biological control of *C. eucalypti*.

The eucalyptus psyllid, a native of Australasia, has been transported around the world on cultivated *Eucalyptus* spp. Hodkinson and White (1979) report that it was "uncommon on ornamental eucalyptus in S. England and Channel Islands. Ireland." With the cultivation of *Eucalyptus* spp. for the production of ornamental foliage and pulp timber production *C. eucalypti* became a pest of sufficient importance in eucalyptus nurseries in Wales and Ireland to warrant the introduction of natural enemies (Hodkinson, 1994). The encyrtid, *Psyllaephagus pilosus* Noyes, also of Australasian origin (Noyes, 1988), was obtained from California {where it had been successfully introduced in 1992 (Dahlsten *et al.*, 1998)} and released in a eucalyptus nursery in Wales in June 1994 (Hodkinson, 1994). Successful biological control was achieved and the parasitoid rapidly dispersed to other areas (see Hodkinson, (1999) for an excellent account of this and other programs for the biological control of this psyllid). The parasitoid was introduced into Ireland in 1998 from France (Malaua and Girardet, 1997); establishment occurred readily (O'Connor *et al.*, 2000). Successful control in the eucalyptus plantation in County Kerry where the parasitoid was first released had occurred by late 1998 and natural spread to other plantations up to 30 km away was reported (Purvis *et al.*, 1999; Hodkinson, 1999).

As I could find no record of *Psyllaephagus pilosus* ever being purposely introduced into the Isle of Man I made inquiries to attempt to ascertain the source and method of its introduction. Also, to determine whether the psyllid and its

parasitoid were widespread in the Isle of Man, I visited several plant nurseries and garden centres and examined eucalyptus trees in several private gardens during the period July, 2002 to July, 2004. The following notes give an overall indication of the status of *Ctenarytaina eucalypti* and its parasitoid *Psyllaephagus pilosus* in the Isle of Man.

### Observations in the Isle of Man

Following the discovery of *C. eucalypti* and *P. pilosus* in the Wild Life Park the Park Manager told me that eucalyptus plants for the Park had been obtained from two local plant nurseries. Both nurseries were visited in August 2002; one, at Jurby (SC3497), periodically obtained plants from a supplier in Lancaster whereas the other, at St Johns (O. S. grid reference SC 2881), grew plants from seed. Inspection of eucalyptus plants at both nurseries failed to detect the psyllid and its parasitoid. On a return visit to the nursery at St. Johns on 12.iii.2003 a few small nymphs and one large mummified nymph were found on one plant of *Eucalyptus nitens* Maiden but no evidence of the psyllid was seen on other plants of this species and of *E. gunnii* Hook, *E. globulus* Labill., and *E. pulverulenta* Sims. {These species commonly support large breeding populations of the psyllid in Britain (Hodkinson 1999)}. A female of *P. pilosus* emerged from the mummified nymph on 18.iii.2003. When revisited on 13.ix.2003, none of the plants had young succulent growth and, despite careful inspection, no trace of the psyllid was found. The psyllid was not found on subsequent inspections on 4.v.2004 and on 19.v.2004 although succulent new growth was present. However adults of the psyllid but no mummified nymphs were found on a small tree planted in the garden of another nursery about 2 km distant on the same day.

During a visit to a garden centre near Douglas (SC 3475) on 14.viii.2002 ten or more plants of a recently received consignment of *Eucalyptus gunnii* (originating in the Netherlands but transhipped via England) were infested with the eucalyptus psyllid suggesting that it might be imported routinely on nursery stock (all of these plants were sold within a fortnight). The parasitoid was not detected in samples from this consignment of plants. Inspection of another consignment of potted plants of *E. gunnii* at this garden centre on 13.viii.2003 yielded a single adult of *Ctenarytaina eucalypti*. The psyllid was not detected when a consignment of eucalyptus plants recently received from the Netherlands was examined on 5.v.2004.

On 1.ix.2002 all stages of the eucalyptus psyllid and a female of the parasitoid were found on eight 3-4 metre high eucalyptus plants in the Ronaldsway Airport car park (SC 2769). The origin of the plants was not ascertained. Three mummified psyllid nymphs were collected; ten days later two females of *P. pilosus* emerged from the mummified psyllids. When the same plants were re-inspected on 18.vi.2003 only a few psyllid nymphs and adults were found on the lower shoots of one plant that were protected by shrubbery; a few of the larger nymphs were collected but they failed to mummify. During a further inspection on 22.vii.2003 only the tip of one branch was infested; a few psyllid adults and small nymphs were seen but there was no evidence of *P. pilosus*. Again on 3.viii.2003 only a few nymphs and adults of

the psyllid were found. On 14.ix.2003 no stages of the psyllid or of the parasitoid were seen; none of the plants had young succulent growth. Several large nymphs and a few adults of the psyllid were collected on 4.iv.2004; most of the nymphs developed to adults, none were parasitised. No psyllids or parasitoids were seen during inspections nor on foliage samples examined through a microscope on 8.iv., 4.v., 3.vi., 1.vii., and 22.vii.2004.

On 8.x.2002 both insects were present on 2-3 metre tall plants of *Eucalyptus gunnii* and *E. pulverulenta* at two other garden nurseries. The plants at one centre (SC 3676) were obtained from a supplier in Devon whereas those at the other (SC 3075) were reportedly grown on site from seed. When the former was revisited on 12.ii.2003 all stages of the psyllid including eggs and adults were present on the same plants of *E. pulverulenta*, but scarce or absent on *E. gunnii*; several of the larger psyllid nymphs were parasitised (mummified). One male and three females of *P. pilosus* emerged from the mummified nymphs during the following fortnight. Infested foliage of *E. pulverulenta* collected on 12.iii.2003 yielded 11 adults of *P. pilosus*. On 30.vii.2003 several adults of *P. pilosus*, numerous mummified nymphs, many with parasitoid emergence holes, and all stages of the psyllid were present. A collection of mummified nymphs yielded over 50 adults of *P. pilosus*; no hyperparasitoids were reared. On 13.ix.2003 there were numerous mummified nymphs, all but two with emergence holes; no live stages of the psyllid were noted nor was there any young succulent growth of the type usually attacked; one female of *P. pilosus* emerged from one of the mummified nymphs. (These were the same potted plants first inspected on 10.x.2002). When revisited on 5.v.2004 all of the plants had been sold.

On 7.ix.2003 several potted plants of *Eucalyptus gunni* in a garden centre at Tynwald Mills (SC 2882) were examined. In the absence of vigorous young plant growth only a few psyllid adults but no eggs or live nymphs were found. However numerous mummified nymphs (35 on one leaf, all but one with parasitoid emergence holes) were present – a male of *P. pilosus* emerged from the intact mummified nymph on 13.ix. The origin of the plants, supplied by a local nursery, was not ascertained. When I inspected those plants that had not been sold on 1.xi.2003 no psyllids were found. However three adults of the psyllid were collected from one of the same plants on 19.v.2004.

A small eucalyptus tree in a garden in Minorca (SC 4384) had a light infestation of *C. eucalypti* when first inspected on 23.ii.2003; several live small and medium nymphs, 9 empty mummified nymphs with parasite emergence holes, one with an emergence hole contained a dead adult of *P. pilosus* and one intact mummified nymph were present on a small sample of foliage. When dissected on 20.iii. the intact mummified nymph contained a dead adult of *P. pilosus*. On 4.vii.2003 all stages of the psyllid were present but only one mummified nymph was found. A female of *P. pilosus* emerged from it between 7-17.vii. No trace of the psyllid or parasitoid was found when the plant was examined on 31.x.2003, 9.I.2004 and 4.vi.2004.

Well established eucalyptus trees were examined in several gardens throughout the island. Invariably these were free of the psyllid.

Nymphs of *C. eucalypti* were present on eucalyptus foliage in a floral arrangement delivered to Laxey by a florist in Douglas on 26.i.2003. Psyllid adults and two males of *P. pilosus* were reared from the nymphs. It was determined subsequently that the flowers and foliage used in the arrangement had been imported by air from the Netherlands.

Another floral arrangement examined in a shop in Ramsey on 18.iv.2003 contained eucalyptus foliage infested with numerous nymphs and a few adults of *C. eucalypti*; although the nymphs were allowed to develop on foliage for several days none mummified.

On 14.v.2003 a shoot of eucalyptus foliage from the Netherlands obtained from the Douglas florist had over 100 psyllid eggs and 20 small nymphs; no mummified nymphs were found on the foliage.

### Discussion

Whereas the time and source of the first entry of *P. pilosus* to the Isle of Man cannot be ascertained with certainty it undoubtedly occurred after its deliberate importation into Britain in 1994, or to continental Europe and Ireland in 1997 for the control of the eucalyptus psyllid. It is well documented that *P. pilosus* spread, unassisted, from the original release sites in Britain sites over distances greater than the distance between mainland Britain or Ireland over a relatively short space of time (Hodkinson, 1999) Although it cannot be entirely ruled out that adults of *P. pilosus* could have flown, or been carried by the wind from mainland Britain this possibility is much less likely than its arrival and establishment from specimens arriving on imported nursery plants or on cut foliage. The frequent importation of psyllid-infested plants by garden centres and plant nurseries strongly suggest that the psyllid, and its parasitoid, gained entrance to, and have been distributed widely in, the Isle of Man by this means. Based on results in Britain (Hodkinson, 1999) the parasitoid could have spread to most areas of the Island from a single introduction of psyllid-infested plants but the present observations suggest that there have been, and will continue to be, multiple introductions of the parasitoid along with its host on eucalyptus plants imported by garden centres for sale to the general public from various parts of the island

The somewhat limited observations suggest that the immature stages of the parasitoid within its host frequently arrive on cut eucalyptus foliage flown to the Island from Europe for the floral trade. Although deemed less likely than by importation on nursery plants it is feasible that field establishment could occur by movement of the psyllid and its parasitoid from discarded flower arrangements to nearby eucalyptus trees.

My observations indicate that both the psyllid and parasitoid successfully overwintered in the Isle of Man; Hodkinson (1999) noted that both species had survived five successive winters under severer winter conditions at a site in Wales where minimum air temperatures of  $-14^{\circ}\text{C}$ . had occurred. However on established trees and even on nursery stock both species may disappear seasonally – or at least become too scarce to detect - in the absence of vigorous succulent juvenile foliage.

The arrival of the parasitoid is probably of greatest benefit to plant nurseries that grow *Eucalyptus* spp. from seed or import small plants to grow on for the production of ornamental plants to sell to the public and to gardeners during the first few years until young plants are well established. Mature trees are known to be less susceptible to damage by the psyllid and have probably benefited only marginally from the arrival of the parasitoid.

### Acknowledgements

The infestation of the eucalyptus psyllid in the Wild Life Park was drawn to my attention by my son, Philip Bennett. Assistance in locating literature and references was provided by R. Nguyen, S. M. Crellin, J. P. O'Connor and Rebecca Murphy. I am grateful to John S. Noyes for identifying the parasitoid *Psyllaephagus pilosus* and for providing relevant background information and to Jon H. Martin for permission to quote his record of *Ctenarytaina eucalypti* for the Isle of Man.

### References

- Dahlsten, D.L., Rowney, D.L. & Copper, W.A., 1998. Parasitoid wasp controls blue gum psyllid. *California Agriculture* **52**: 31-34.
- Hodkinson, I. D., 1994. Biocontrol of the eucalyptus psyllid in the UK. – a request for help. *Antenna*. **18** (4): 205.
- Hodkinson, I. D., 1999. Biocontrol of the eucalyptus psyllid *Ctenarytaina eucalypti* by the Australian parasitoid *Psyllaephagus pilosus*: a review of current programmes and their success. *Biocontrol News and Information*. **20**(4): 129-134N.
- Hodkinson, I.D. & White, I.M., 1979. Homoptera, Psylloidea. *Handbooks for the Identification of British Insects*. Vol.II: Part 5(a): 98 pp.
- Malausa, J.-C. & Girardet, N., 1997. Lutte biologique contre le psylle de l'eucalyptus. *Phytoma* **50**(498): 49-51.
- Noyes, J.S., 1988. Encyrtidae (Insecta: Hymenoptera). *Fauna of New Zealand*. **13**: 1-188.
- O'Connor, J.P., Nash, R. & Boucek, Z., 2000. A Catalogue of the Irish Chalcidoidea (Hymenoptera). *Occasional Publication of the Irish Biogeographical Society*. **6**: 1-135.
- Purvis, G., Dunne, R. & Chauzat, M.-P., 1999. Biological control of Eucalyptus psyllid. *Farm and Food*, **8**(4):24-25.

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### Rannoch Sprawler *Brachionycha nubeculosa* (Esp.) (Lep.: Noctuidae) sitting in full sun

Those who still search for resting moths by day know that the shady side is the most profitable place to look. As South (1907, *The Moths of the British Isles*) advises, few moths will be found sitting in full sun. Some of the early spring Scottish specialities, however, appear to be exceptions. In such latitudes the sun is weak at this time of the year, so both day and night temperatures are usually low. Overheating is unlikely to be a problem. On the contrary, basking might actually help a moth's metabolism.

In the days before portable mercury vapour light traps, the Rannoch Sprawler *Brachionycha nubeculosa* was traditionally found by searching for the